

What is claimed is:

1. A switching power supply unit comprising:

a switching power supply section for converting an input voltage into a higher output voltage by switching in accordance with a switching control signal, to output the
5 higher output voltage;

a soft start section for producing a soft start voltage which gradually increases at start-up;

a voltage comparing section for comparing the output voltage with a first reference voltage;

10 a low-voltage circuit section, which compares the soft start voltage with a feedback voltage obtained by feeding back the output voltage, for producing a pulse signal when the soft start voltage is high; and

15 a high-voltage circuit section, which compares either a second reference voltage or the soft start voltage with the feedback voltage according to a relationship of a level of the second reference voltage and a level of the soft start voltage to produce an error signal, for producing a PWM control signal based on a comparison result of the
20 error signal with a triangular wave signal,

wherein when the output voltage is lower than the first reference voltage, the pulse signal is output as the switching control signal, and

when the output voltage is higher than the first reference voltage, the PWM control signal is output as the switching control signal.

5 2. The switching power supply unit according to claim 1, wherein the low-voltage circuit section involves:

a comparator for producing a comparison output when the soft start voltage is higher than the feedback voltage;

a pulse generator for producing a pulse signal

10 according to the comparison output from the comparator; and

a first driver, which is driven by the comparison output from the voltage comparing section, for outputting the pulse signal as the switching control signal, and

the high-voltage circuit section involves:

15 an error amplifier, which compares either the second reference voltage or the soft start voltage with the feedback voltage according to a relationship of a level of the second reference voltage and a level of the soft start voltage to produce the error signal, for feeding back the
20 error signal to the feedback voltage by way of a feedback element;

a triangular wave signal oscillator for producing the triangular wave signal;

a PWM comparator for producing the PWM control signal

25 based on a comparison result of the error signal with the

triangular wave signal; and

a second driver, which is driven by the comparison output from the voltage comparing section, for outputting the PWM control signal as the switching control signal.

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3. A controller IC for controlling a switching power supply section for converting an input voltage into a higher output voltage by switching in accordance with a switching control signal, to output the higher output
10 voltage, comprising:

a soft start circuit, which cooperates with a capacitor, for producing a soft start voltage which gradually increases at start-up;

a voltage comparing section for comparing the output
15 voltage with a first reference voltage;

a low-voltage circuit section, which compares the soft start voltage with a feedback voltage obtained by feeding back the output voltage, for producing a pulse signal when the soft start voltage is high; and

20 a high-voltage circuit section, which compares either a second reference voltage or the soft start voltage with the feedback voltage according to a relationship of a level of the second reference voltage and a level of the soft start voltage to produce an error signal, for producing a
25 PWM control signal based on a comparison result of the

error signal with a triangular wave signal,

wherein when the output voltage is lower than the first reference voltage, the pulse signal is output as the switching control signal, and

5 when the output voltage is higher than the first reference voltage, the PWM control signal is output as the switching control signal.

4. The controller IC according to claim 3,

10 wherein the low-voltage circuit section involves:

a comparator for producing a comparison output when the soft start voltage is higher than the feedback voltage;

a pulse generator for producing a pulse signal according to the comparison output from the comparator; and

15 a first driver, which is driven by the comparison output from the voltage comparing section, for outputting the pulse signal as the switching control signal, and

the high-voltage circuit section involves:

20 an error amplifier, which compares either the second reference voltage or the soft start voltage with the feedback voltage according to a relationship of a level of the second reference voltage and a level of the soft start voltage to produce the error signal, for feeding back the error signal to the feedback voltage by way of a feedback element;

a triangular wave signal oscillator for producing the triangular wave signal;

a PWM comparator for producing the PWM control signal based on a comparison result of the error signal with the
5 triangular wave signal; and

a second driver, which is driven by the comparison output from the voltage comparing section, for outputting the PWM control signal as the switching control signal.

10 5. The controller IC according to claim 3, further comprising:

an external terminal to which is connected the capacitor for producing the soft start voltage in cooperation with the soft start circuit.